Glossary

The definitions given here pertain to how the term is used in this chapter and are not meant to encompass alternate meanings that would be appropriate for other contexts.

Algific: This obscure term simply means cold producing. In this document it refers to talus slopes in which ice has formed. Cold air emitted from the talus throughout the growing season creates a cold, moist microhabitat that may support an assemblage of unusual plants and invertebrates.

Alliance: In plant ecology, an alliance is a way to group plant communities that share some characteristics. Alliances are used by some conservation organizations (for example, NatureServe) to group somewhat similar plant associations.

Association: In plant ecology, an association is a recurring assemblage of plants characterized by one or several dominant species.

Backdune: These occur away from the immediate proximity of a dynamic shoreline with active dunes and are usually characterized by denser, more stable vegetation, which includes shrubs and trees. The substrate is still largely made up of unconsolidated sand. Also referred to as a "secondary dune."

Barrens: Refers to fire-prone, fire-dependent savanna vegetation that characterizes sites with low-nutrient, droughty, usually sandy substrates. In the absence of fire, these communities can quickly become dense forests or thickets of pines, oaks, or other woody species adapted to harsh, xeric environments.

Bog: This term has various definitions, which can be confusing or even contradictory. To wetland ecologists, a "bog" is a peatland community characterized by high acidity, anaerobic conditions, low temperatures, and extremely low nutrient availability ("oligotrophic"). In the strictest sense, nutrient sources for bogs come almost entirely from precipitation ("ombrotrophic"). The accumulation of acidic peat derived from Sphagnum mosses eventually isolates the bog community from direct contact with mineral-enriched ground or surface waters. The "Open Bog" community lacks trees or has less than 25% cover of small and stunted conifers, most often black spruce and/or tamarack, less often with jack pine, as the woody associates. The similar "Treed Bog" is an acid peatland community recognized in some jurisdictions outside of Wisconsin. It is very weakly minerotrophic and has somewhat larger trees and higher tree cover (e.g., 25%–60%).

In popular usage, "bog" is sometimes applied to any wetland that is difficult for humans (or large four-legged animals) to move across or use due to saturated, sometimes treacherous, substrates (e.g., to "get bogged down"). In common parlance, the connotation is sometimes negative or even pejorative ("useless," "wasteland").

Brown mosses: A diverse group of bryophytes that are common and sometimes form the dominant ground layer in rich, herb-dominated fens. Important genera include Campylium, Dicranum, Drepanocladus, Hypnum, and Scorpidium. These tend to replace peat mosses from the Sphagnaceae (*Sphagnum* spp.), which are characteristically dominant in more acid peatlands. Crum (1984) defines brown moss as "a true moss, as opposed to a white moss, or peat moss."

Calciphile: Usually applied to plants growing in, well-adapted to, or requiring a calcium-rich habitat. Also "calcicole."

Canadian Shield: Bedrock of Precambrian age, over 600 million years old, composed mostly of igneous and metamorphic rocks that are either overlain by glacial deposits or exposed at the surface. The Canadian Shield underlies the eastern two-thirds of Canada. In the United States, it is most prominent in parts of the Upper Midwest in northern Wisconsin, western Upper Michigan, and northeastern Minnesota.

Carr: This term has been applied by ecologists, especially in England, to wetland vegetation dominated by tall shrubs (so, in this sense, "shrub-carr," the term long used in Wisconsin, translates to "shrub-shrub").

Continuum: As defined and used here, continuum refers to a situation where "the stands of a community or larger vegetational unit are not segregated into discrete and objectively discernible sub-units but rather form a continuously varying series" (Curtis 1959).

Cover type: A term used as a land cover descriptor. In the context of this document, most often applied to vegetation, based on one or a few of the currently dominant plant species in the most prominent (usually the tallest) vegetation layer.

Crosswalk: A crosswalk is a tool enabling the translation of the units recognized in one vegetation classification system with those of another. These comparisons are seldom equivalent on a 1:1 basis. As an example, in each ecological landscape chapter, a crosswalk is provided that establishes similarities between the natural communities described here and the "habitat types" presented in Kotar et al. (Kotar and Burger 1996, Kotar et al. 1988, Kotar et al. 2002), which are used by some foresters in Wisconsin. In the National Vegetation Classification (NVC) (Faber-Langendoen 2001), synonyms are given to establish relationships between the NVC associations and the community classifications used by state and provincial Heritage programs across the U.S. and Canada.

Density: A specialized usage of the term to indicate the number of plant individuals per unit area. May be expressed in absolute terms or as relative density, which is the number of individuals of a particular species as a percentage of the total number of individuals of all species on the same area.

Developmental stage: Used here to describe changes within a stand of a community that are more structural in nature (e.g., following a natural or anthropogenic disturbance, where the same group of species remain prevalent at a given site), rather than compositional. Where the replacement of one species group by another takes place (which we define here as "succession," such as an old field that undergoes a series of shifts in the dominant species).

Differential Isostatic rebound: See "isostatic rebound."

Disjunct: In a word, "separated." Used to describe outlying populations far from the core range of a particular species. In some cases, for example when there has been a dramatic environmental change, populations that formerly shared a contiguous range may become increasingly isolated and eventually disjunct. But this may also be dependent on the dispersal capabilities of the species under consideration. Climate shift, habitat loss, and persecution are among the underlying reasons causing this phenomenon.

Dominance: A measure of the total size, bulk, or weight of the individuals of a particular species on a particular area.

Ecological trap: These may occur when anthropogenic changes to an environment create habitat that appears suitable for a species but that, when occupied, results in that species' decreased fitness.

Ericad: A member of the heath family, the Ericaceae. The ericads constitute an extremely important group of shrubs that thrive in acidic low nutrient environments such as northern peatlands. Some members, such as the blueberries and huckleberry, are also characteristic of xeric forest and barrens communities on acid, nutrient-poor sands.

False bottom: A muddy suspension of undecayed organic matter, including planktonic remains in minerotrophic bog lakes, eventually exposed at the surface and allowing the advance of mat-forming sedges leading toward a fen-bog succession. The term is also sometimes used to reference peat buoyed up by methane production (Crum 1988.)

Fen: A minerotrophic peatland community that receives nutrients from the underlying substrate, usually via ground and surface waters. Fens may be moderately acidic, neutral, or alkaline. In *Vegetation of Wisconsin*, Curtis (1959) limited his discussion of fens to the wetland community of southern Wisconsin with "an internal source of water relatively rich in carbonates" that he termed "calcareous fen." But elsewhere in the Midwest (and in much of the rest of the world), other fen communities are recognized based on factors such as associated peat landforms, water chemistry, and species composition.

Foredune: The foredune is a ridge composed of loose sand, adjacent and parallel to the shoreline of an adjoining waterbody such as a large lake, estuary, or ocean.

Forest: Vegetation in which trees comprise over 50% of the cover. Not to be confused with "timberland," which has been used primarily in economic analyses of timber abundance and is not ecology based.

Fossorial: Used as a descriptor for animals, including some mammals, herptiles, and insects, that can burrow beneath the surface of the earth. The burrows and associated soil disturbance provide important microhabitats for specialized plants and animals that use but do not create burrows themselves.

Frequency: A measure of the commonness and widespread distribution of plant individuals in a single stand of a community. Usually determined from widely dispersed samples of fixed area and expressed as the ration of occupied samples to total samples examined, on a percentage basis.

Glade: Glades are natural communities that occur on and are strongly influenced by bedrock that is exposed or covered by very thin layers of mineral (or rarely, organic) soil. Vegetation may include trees, shrubs, or herbs, but overall cover is typically sparse. Nonvascular plants such as mosses and lichens are important and sometimes restricted to such environments. In Wisconsin, glades may occur on quartzite, dolomite, rhyolite, granite, basalt, and sandstone.

Greik: Greiks are natural fractures in sedimentary bedrock such as limestone or dolomite. The term is used in some of the technical literature describing and discussing sedimentary bedrock in east central and northeastern Wisconsin, sometimes in the context of how pollutants behave in such areas and their impacts on groundwater.

Habitat type: The "Forest Habitat Type Classification System" classifies sites based on the identification of repeatable patterns of understory composition (Kotar and Burger 1996, Kotar et al. 1988, Kotar et al. 2002). The habitat types are developed independently from current tree species composition and condition and can be applied to most upland forest stands (see "cover type" and "natural community" for other methods of classifying land cover).

Hydric: Wet! As applied to soils, saturated, or inundated by flooding or ponding, long enough during the growing season for anaerobic conditions to develop in the soil.

Importance value (I.V.): A measure of the significance of a plant in a stand or in a community, expressed as the total of its values for relative density, relative frequency, and relative dominance, with a possible range from 0 to 300. See Curtis (1959) for more.

Indicator species: Applied by some plant ecologists and aquatic biologists to a subset of species whose presence indicates a specific set of environmental conditions, enabling broader characterizations of the habitat in which an assemblage of plants and animals occurs.

Isostatic rebound: The rise of land masses depressed by ice sheets during the last ice age. "Differential isostatic rebound" takes into account the variable impacts of this process within an area affected previously by the weight of the ice.

Kettlehole or glacial kettle: A depression created when a block of glacial ice is stranded by and isolated from a retreating glacier and then surrounded and/or covered by glacial till. When the ice melts, a kettlehole is the result. Some kettles fill with water and become kettle lakes. These are often surrounded by boggy peatland vegetation.

Lagg: The "lagg' is a zone (sometimes referred to as a "moat") of standing or slowly moving mineral-enriched water bordering a peatland at the upland-wetland interface. The vegetation is composed mostly of graminoids or tall shrubs and sometimes includes trees such as ashes or elms. Footing for large two-legged mammals is notoriously treacherous, and the presence of plants such as poison sumac can make traversing one of these and emerging unscathed a challenge worthy of extra hazard pay.

Loess: A fine-textured, wind-blown, mineral soil material composed of silt particles.

Macroinvertebrate: An easily observed large invertebrate. Examples include many common insects (butterflies, moths, dragonflies, many beetles) and arachnids and most mussels.

Macrophyte: An easily observed large plant. Most often used as a descriptor for aquatic plants such as cat-tails, bulrushes, pond lilies, and pondweeds, as in "aquatic macrophytes."

Marl: Marl is a whitish precipitate of calcium carbonate that accumulates on the bottoms and aquatic vegetation of spring-fed ponds and lakes with extremely hard (alkaline) water. At some locations, marl deposits have been mined for use as an acidic soil conditioner and in the cement-making industry.

Marsh: A permanently saturated or inundated minerotrophic wetland, usually on a mineral substrate, composed mostly of robust graminoid plants such as cat-tails, rushes, bur-reeds, and/or grasses or of floating-leaved species such as pond lilies, or of submergent species such as pondweeds. Peat accumulation is minimal or absent (although see Harris et al. 1996).

Melanized: As applied to soil descriptions, made black or dark, usually through the addition of organic matter.

Mesic: With adequate but never excessive moisture available throughout the growing season.

Minerotrophic: In the context of peatland communities, receiving nutrients from groundwater and therefore rich in available minerals as compared to an "ombrotrophic" environment in which the minerals come only from atmospheric sources.

Mor humus: Humus characterized by thick accumulations of undecomposed or partially decomposed plant litter, such as that associated with coniferous forests and the thick layer (the duff) of needles that covers the forest floor.

Muck: Soils consisting of highly decomposed plant material in which the individual components are no longer identifiable. Mucks are characteristic of communities such as hardwood swamps, alder thickets, and some sedge meadows. See "Peat" below.

Mull humus: The highly mixture of decomposed organic material and mineral matter that is most characteristic of the top layers of mesic hardwood forest soils.

Naturalized: An organism that lives as if wild in a region to which it is not native is said to be "naturalized."

Old-growth forest: Generally defined by the Wisconsin DNR as "a forest that is relatively old and relatively undisturbed by humans." Old-growth forests were further defined as "a community with dominant trees at or near biological maturity. Age and structure of an old-growth community varies with species and site. Old-growth stands are sometimes characterized by a multi-layered canopy, uneven age and size class structure, a high degree of compositional and structural patchiness and heterogeneity, and significant amounts of woody debris and tip-up mounds." For additional background and details, see Handbook 2480.5 (WDNR 2006).

Oligotrophic: Usually applied to water bodies with low nutrient availability, low primary productivity, sparse plant growth, and high oxygen levels.

Ombrotrophic: Describes ecosystems receiving all, or the vast majority of, their nutrient inputs exclusively from atmospheric sources. Most often used here as a descriptor of strongly acid peatlands, such as Open Bog, Muskeg, and Black Spruce Swamp (see "Minerotrophic").

Paludification: A term used by wetland ecologists to describe the expansion of peatlands into upland sites and vegetation types.

Patch size: Under relatively unmodified landscape conditions, especially with natural disturbance regimes intact, many communities occur in characteristic patch sizes and/or configurations. Terms used in the text of this chapter relevant to patch size are

small patch – from a fraction of an acre to a few 10s of acres;

medium patch – from 10s to a few 100 acres;

large patch – from hundreds to several 1,000 acres;

matrix – covering 10s of 1,000s of acres or more and within which other communities are typically embedded;

linear – used to characterize natural features that are not well described by dimensions of length and width to measure occupied area (acres or hectares). Length alone may sometimes be used to describe features such as cliffs, bedrock escarpments, stream courses, and lake shorelines.

Peat: Peat is organic soil consisting of the partially decomposed but still identifiable remains of various plants, which may include mosses, vascular herbs, or woody species. Peat soils contain at least 20%–30% organic material by weight.

Peatland: In Wisconsin, this term encompasses a group of wetland plant communities in which the rate of accumulation of dead plant material exceeds the rate at which that material decomposes. Over time the peat accumulates, sometimes drastically changing the nature of the communities in which this process is occurring.

Peatland communities have been divided into two basic types: "bogs" and "fens." These may be further subdivided based on hydrology, water source, water chemistry, peat landform, indicator species, and vegetative structure. In peatland communities, the dominant plants may be mosses, vascular herbs, shrubs, or trees. Examples include Open Bog, Muskeg, Poor Fen, Black Spruce Swamp, and Northern Tamarack Swamp. See Wright et al. (1992) for expanded descriptions and details.

Peat moss: This term is applied broadly to mosses of the genus *Sphagnum* and sometimes more broadly to a more diverse group of moss genera that over time form peat substrates where the rate of decomposition is less than the rate at which dead plant material—the peat—accumulates. In Wisconsin, most peatlands are acidic, and members of the genus *Sphagnum* are overwhelmingly important and usually dominant. Other mosses also form peat, including species in genera such as *Bryum*, *Campylium*, and *Drepanocladus*. These usually occur and may become common in more alkaline wetlands, such as rich fens and some sedge meadows.

Perched wetland: Technically, a wetland may be termed "perched" when an impervious layer of soil or rock occurs within the aeration zone, i.e., above the level of the local water table.

Periglacial: Refers to species that occur in unglaciated or recently deglaciated areas at the margins of glaciers. The term "periglacial relict" describes species that inhabited areas at glacial margins but became "stranded" and unable to disperse at rates that matched glacial retreat. Over time, populations of these species became isolated in unusual microsites embedded within regional habitats which would no longer sustain the periglacial specialists adapted to constant cool and moist conditions. Among the taxa encompassed by this definition are several species of globally rare terrestrial gastropods, now restricted in distribution to habitats that remain cold even during the midwestern growing season because of unusual geology. See natural community description for "Algific Talus Slope."

Photobiont: The photosynthetic component of a lichen, for example, a green alga.

Prairie: An herb-dominated natural community in which the flora is composed mostly of native grasses and forbs. Fire, periodic drought, and free-ranging ungulates were among the historical factors that maintained prairie vegetation. In Wisconsin, six prairie communities are recognized, with the vast majority of occurrences found south of the Tension Zone. Continentally, Wisconsin is at the northeastern margins of the range of prairie vegetation.

Primary community: These biotic assemblages develop on unvegetated substrates lacking a soil profile, often on sites where there are exposures of bare rock, mud, or sand. Some of the more familiar examples of primary communities are beaches, dunes, rockshores, mudflats, talus slopes, and cliffs. Development may be exceedingly slow (e.g., on bare rock) or quite rapid (where natural disturbances are frequent and severe).

Rich: This term has several meanings when used in an ecological context. It may refer to high species diversity or to relatively high levels of nutrients available for plant growth.

Savanna: A dynamic natural community that is characterized by a scattering of trees interspersed with herb-dominated openings. In the Upper Midwest, the primary factor that maintained such vegetation was periodic wildfire. Elsewhere in the world, key roles are played by climate, drought, and herds of free-ranging grazing and browsing mammals.

The arbitrary figures of more than 10% and less than 50% tree cover have been used in Wisconsin to describe and define savannas, but after nearly a century of widespread fire suppression and logging, these numbers are really not very useful. Better clues to determining whether you are looking at a savanna or a forest are available by looking at the understory composition, the limb architecture of the largest trees, the composition and density of woody seedlings and saplings, and if you're lucky, evidence of past wild fires.

Several savanna types are currently recognized on the Natural Heritage Inventory's list of tracked natural communities. Most of these are on dry, nutrient poor sites; the mesic savannas (historically, these would have been a large percentage of the oak openings) are virtually extinct.

Sclerophyll: A woody plant that is evergreen, with tough, thick leaves that reduce water loss.

Specific conductance: In water, specific conductance is an indirect measure of the presence of dissolved solids (including calcium, magnesium, iron, sodium, chloride, nitrate, phosphate, and sulfate). It can be a useful means of classifying waterbodies, monitoring changes in water chemistry, and detecting pollution. Basically, it measures how well water can conduct an electrical current.

Spring ephemeral: In the strictest sense, this term refers to native plants that complete the above-ground portion of their life cycle early in the growing season, when the deciduous canopy trees are just beginning to leaf out and abundant light reaches the forest floor. Spring ephemerals are characteristic of and strongly associated with (though not restricted to) mesic hardwood forests, especially on finer-textured, neutral to alkaline, nutrient-rich soils with mull humus.

Submergent aquatic macrophytes: This group of vascular plants features prominent leaves that are best developed beneath the water's surface. Familiar groups of submergent aquatic plants include the pondweeds (*Potamogeton* spp.), some of which include both submerged and floating leaves, and naiads (*Najas* spp.). For additional information, see the description in this chapter of "Submergent Marsh."

Succession: In general terms, a gradual, often directional, process by which ecosystems change over time. "Primary succession" refers to the usually sparsely vegetated community that characterizes a previously unvegetated substrate, such as bare rock, sand, clay, or mud. Often, this is a very slow process.

"Secondary succession" describes the much studied and often described process of ecological change that occurs following disturbance of a previously vegetated site. Sometimes it used interchangeably with "developmental stage," but it can be useful to separate and distinguish these terms: "succession" primarily involving changes in species composition and "developmental stage" referring more to changes in stand structure rather than overall shifts in composition.

Supercanopy: "Supercanopy" refers to the very tall trees that project well above the average height of the other trees in an otherwise complete forest canopy. In Wisconsin, eastern white pine is the most common supercanopy species, but red pine, white spruce, and eastern cottonwood are examples of other trees that may also occupy this vegetative stratum. A supercanopy consists of scattered individuals, rather than a dense or continuous layer of trees. Ecologically, supercanopies add structural complexity to forests while alive and can provide nest sites and perches for birds such as Bald Eagles. When the trees die, they are important either as standing snags or as a source of coarse woody debris.

Surrogate grassland: A broad category used to refer to vegetation composed mostly of nonnative graminoid herbs that create habitats bearing structural similarities to native grasslands such as prairies and sedge meadows. They are now of especially high importance to grassland vertebrates such as birds and some mammals that can no longer find suitable habitat in remnants of our severely decimated native grasslands.

Swamp: In *The Ecological Landscapes of Wisconsin*, swamps are defined as wetlands dominated by woody plants, either trees (e.g., "conifer swamp," "hardwood swamp") or shrubs (e.g., "shrub swamp"). Do NOT "drain the swamp"—it is ecologically unsound.

Talus: Talus is made up of angular rock fragments that accumulate at the base of a cliff, escarpment, gorge, or bedrock-cored ridge. Vegetation on talus slopes is typically sparse but may include extreme habitat specialists, especially among the nonvascular plants such as lichens and mosses. Though usually dry to extremely dry, localized portions of some talus slopes may be fed by springs, and cold air drainage may also significantly influence the biota. Cold air may emanate from talus slopes during the growing season, especially if ice has formed between the talus blocks during the winter.

Trough: As used here this term refers to hollows between active sand dunes created and maintained by wind (or sometimes water) action. Troughs that periodically intersect the water table may support unusual plant communities, such as Interdunal Wetlands.

Woodland: Often used interchangeably with "forest." However, the term is used in other parts of the world to describe a "low density" forest or one in which the canopy is composed of species that allow openings to occur, either in gaps or due to a leaf mosaic that allows more light to reach the surface (in Wisconsin, some of the oaks, compared to the mesophytic trees, allow this to happen). Here we use "woodland" to describe vegetation with relatively high canopy closure but an open understory that allows herbs requiring more light than plants adapted to true forest conditions to thrive. Fire (especially light ground fires of high frequency) was the historic disturbance dynamic that created this condition. On a continuum of fire-dependent ecosystems in southern Wisconsin, woodlands occurred between the more open savannas and closed canopy forests. In the absence of fire, this community disappears quickly. See the more detailed description of "Oak Woodland" in the natural community accounts of this chapter.